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ABSTRACT

According to the document, Americans within the last few generations have changed their way of living from rural to urban life; are enjoying higher living standards; and, in the process, have polluted the natural environment through improper planning and lack of environmental education. It is believed that the human relationship tc the environment represents one of this century's greatest changes and one of education's most serious challenges. It is noted that there is a need to awaken an entire new generation of citizens, planners, developers, engineers, and scientists to the idea that mankind is but a part of the environment and that what affects the environment will also affect mankind profoundly. It is felt that a well-developed school site functioning as an outdoor classroom can be of real value in enriching the curriculum and providing for educational and recreational experiences throughout the child's school years, in addition to serving as extensions of the indoor classroom. The main body of the document is focused on school-site learning experiences as a vital part of a total environmental education program, and procedural steps for developing an outdoor laboratory and how to use one are included in the document. (EL)

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Preface

There are many reasons why school administrators should be concerned with an outdoor environmental study area on their school site. Within the past few generations Americans have changed their way of living from rural to urban life. We are enjoying the highest living standards of any nation. With all this affluence gained within a few decades, we have also managed to change the environment of man. We have polluted every major stream; plundered our forests; ruined a million acres of land a year through erosion and poor land development; caused problems with wildlife, insecticides, and herbicides; reached a dangerously low level of our fossil fuels and minerals; and have even made a sewer of the air we breathe.

The human relationship to the environment presents one of this century's greatest changes and one of education's most serious challenges. We need to educate an entire new generation of citizens, planners, developers, engineers and scientists to understand that mankind is but a part of the environment and what affects the environment will also profoundly affect mankind.

Perhaps just as important is the need for an appreciation for intangibles—a special feeling for the earth, for beauty and order and for all things that share this planet with us. The outdoor laboratory provides a place for first hand experiences—where children can SEE and HEAR and FEEL the things about them—where they can develop an ecological awareness, and a feeling of responsible stewardship for the natural environment.

A well developed school site functioning as an outdoor classroom can be of real value in enriching the curriculum and providing for educational and recreational experiences throughout the child's school years. It is an extension of the indoor classroom. Here a child and his teacher can explore, investigate, gather information, make decisions and by becoming involved discover the interrelationship of man and his environment.

Learning experiences on school sites can be a vital part of a total environmental education program aimed at bringing our youth to a fuller understanding of environmental resource problems and their present and future role in helping to resolve these problems.

Eleanor H. Bennett
Conservation Education Adviser

Sites For Conservation And Outdoor Education Areas

Pennsylvania schools in many cases, have a considerable acreage on which good stewardship should be practiced.

Too often no consideration is given as to how the school site can be used to improve the school curriculum. Many times valuable educational features are destroyed during construction. Trees and brush are bulldozed; aquatic areas are drained or filled; and the site is leveled. This type of development is more costly to create and more expensive to operate. As a result of clearing and leveling practices more air-conditioning is necessary. Lack of trees results in more wind, more heating costs, more seeding and more mowing of lawns.

How can this waste be avoided? When the land has been acquired a site planning committee should be set up. This planning committee should consist of a key administrator, the architect for the building, a landscape architect, the supervisor of buildings and grounds, a school board member, teachers, students and natural resource consultants. It would be their job to assist the architect in planning for utilization of the site to maximize educational benefits.

This committee would be responsible for locating and preserving natural features, such as trees, wildflowers, selected open areas, rocks and wetlands which would enhance the property. Historical features should not be overlooked. The committee should select the outdoor laboratory site. They should evaluate and make recommendations on the school building location. Too often the school building location is chosen purely for aesthetic reasons.

Fence the outdoor laboratory site and let it grow—nature will develop it. Maintenance people must be informed about the outdoor laboratory boundaries to prevent destroying the area by "neat" mowing.

Plans for new schools should designate habitats to be saved. Existing schools should preserve samples of existing environments and create greater diversity through student projects in conservation.

Checklist of Educational Environments Desirable for School-controlled Properties

Dr. John W. Brainerd, professor of biology at Springfield College, Springfield, Mass. suggests the following types of environments which should be preserved to create opportunities for better conservation and outdoor education.

Barelands

Paving as in the parking lot or paved play area. Useful in studies of microclimates and water runoff, correlated with physical sciences and geography.

Planting soil as on eroding bank or field corner where children can perennially experiment with digging, grading, mulching and stabilizing with plants, then lay it bare again.

Borders

Trees and shrubs may be planted as borders around the school property. Not only do they serve as a teaching tool, but they may also act as windbreaks, screens, beautification plantings and provide food and cover for wildlife.

Courtyards

Enclosed and semi-enclosed courtyards can make outstanding outdoor laboratories. Well planned tree, shrub, and grass plantings with a rustic fence, some rocks and a wetland area can create a learning laboratory.

Elevations

Slopes: Have educational uses related to esthetics, soil types, microclimates, water shed studies and distribution of plants and animals. All areas for active play need not be level.

Hilltops: A properly maintained view from a hill, even a low one, can give students an improved perspective on their environment, whether they are studying astronomy, weather, or patterns of human culture.

Forblands

Forbs are herbaceous (non-woody) plants other than grasses such as Queen Anne's Lace. There are too many types to try to characterize, but a school should try to include at least a demonstration or natural patches of the following:

Pioneer Annual Herbs: Revegetating bare land to be laid bare again at intervals.

Perennial Herbs: Representing later stages of plant succession on bare land. To the layman, these are often "unsightly weed patches", but to the scientist and artist, these are treasure houses.

Grasslands

Lawns: For beauty and soil stabilization. Some should be designated as experimental lawn for the children to study. Many schools have a disproportionately large lawn to the detriment of other possible environments.

Turf for Playfields: With grass species best adapted to heavy wear and tear.

Rough Grass Areas: With perennial species inexpensively maintained by an occasional mowing with sickle bar or scythe, or by grazing.

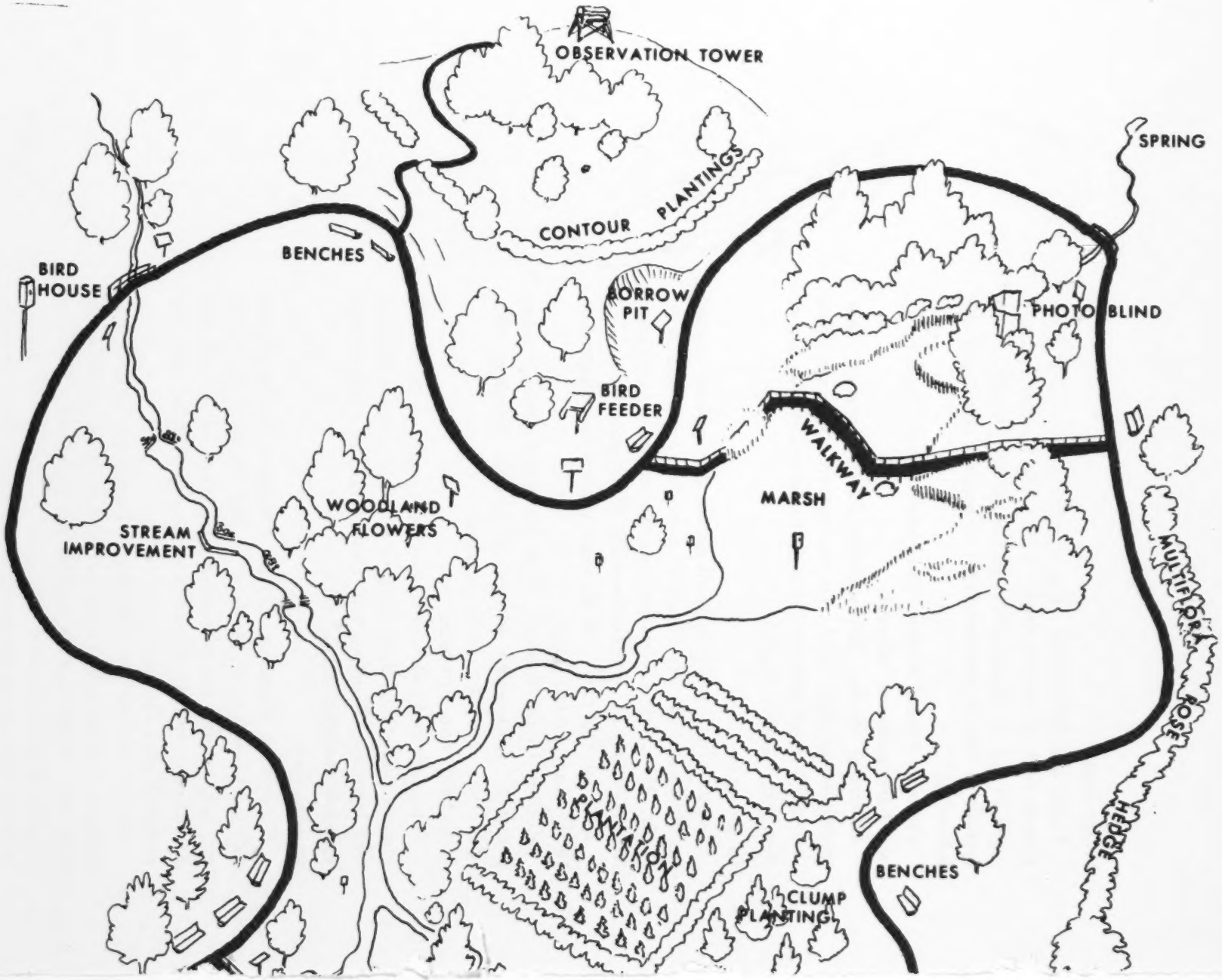
Odd Area and Corners

Often an isolated corner can be planted with a well planned variety of trees, shrubs, flowering plants, grasses and legumes. Planting will change useless corners into valuable teaching areas.

Shrublands

Foundation Planting, Corner Planting, Facing Plantings: Unfortunately, these go in and out of style. They are very useful for educational purposes so should not be entirely omitted, although some compromise with the architect may be necessary.

Hedges and Screen Plantings: Useful for beauty, life sciences and as boundaries to delimit areas of different land use. Important as windbreaks and dust filters for control of microclimates. (But don't permit tall shrubbery close to automobile roads where it could hide a scampering child from a driver's view.)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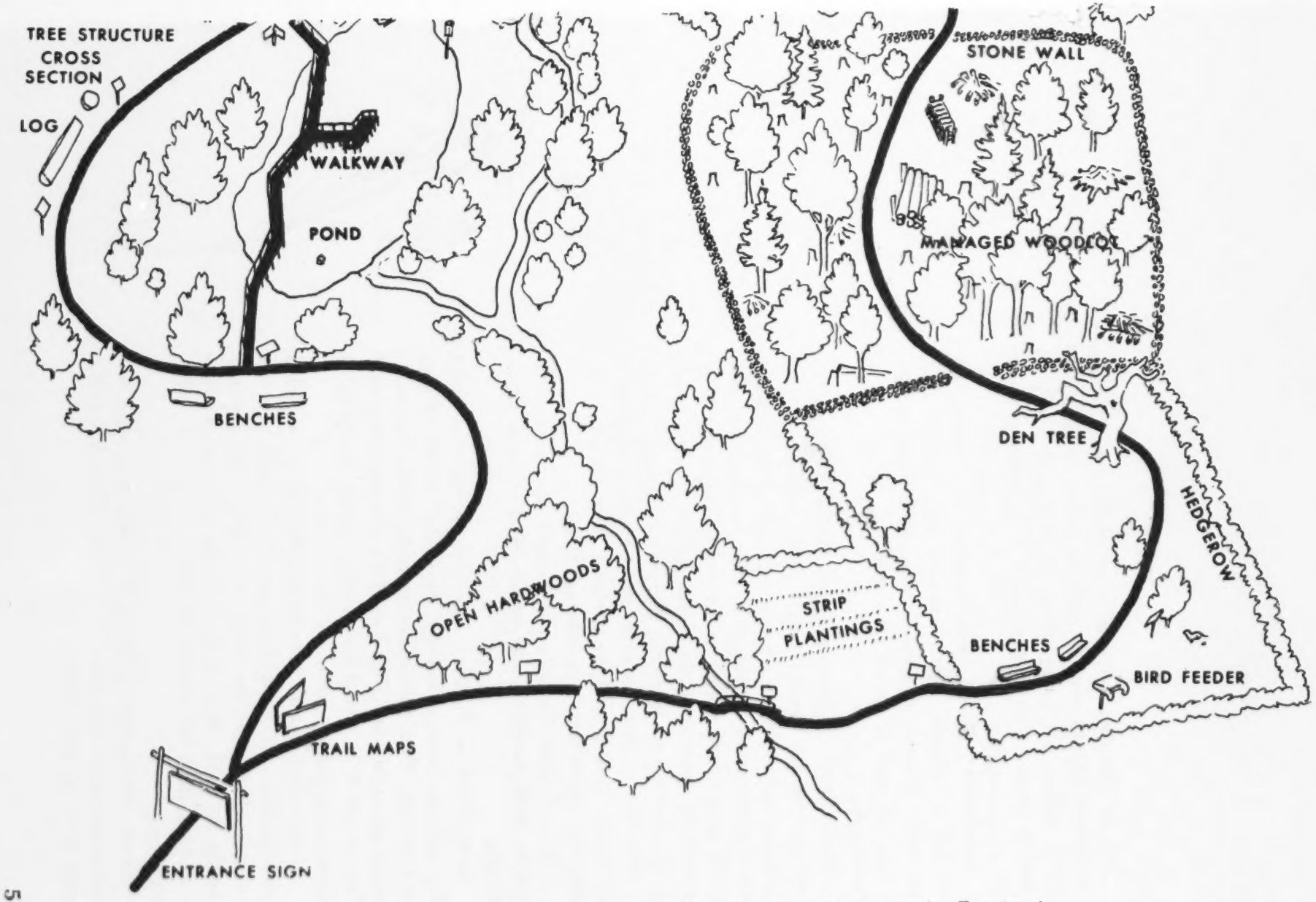

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Special Plantings: Collection of flowering shrubs, small-fruit garden, shrubs used in crafts, wildlife food patch, shrubs for experimental pruning and a wildlife feeding station. Also suggested is a barbecue area for home economics.

Brushlands: Much misunderstood by laymen, but needed at schools. Native shrubs may appear above perennial grasses in plant succession or flourish after cutting of trees or sprout after fire.

TREELANDS

Shade Trees: Either planted or the existing trees. Of obvious use for beauty, nature study, effect on microclimates, yet too often destroyed in site preparation because of economic advantage to the contractor, who may think he is saving money by wholesale bulldozing. Evergreens are favored on the north side of a building and deciduous trees on the south side of a building.

Plantations: Such as orchards, Christmas trees, trees for posts, lumber and by-products from thinning and pruning; arboretum; experimental forest.

Native Woods: Samples of various forest types of the region, both managed and preserved as natural areas.

WATER

Lake, Pond, or Puddle: Any body of water is useful for teaching physics, biology, chemistry, social sciences and the arts. Both natural bodies and artificial impoundments are highly desirable. Especially save natural ponds! Consult the U.S. Soil Conservation Service for help in constructing school ponds.

Stream: Any stream, even temporary rills, are valuable teaching aids. If a *playfield* must be located where a brook is, don't bury the brook in a culvert but divert it around the field. Keep natural brooks wherever possible —and pan them for educational gold.

WETLANDS

Marsh: Herbaceous plants such as cattails, grasses and rushes emerging from water or wet soil. Water has gentle fresh-water or saline flow.

Shrubswamp: Low, woody growth in wet soil or water, with some flow of water.

Swamp: Forested wetland or shallow-water area, with some flow of water.

Bog: Water is stagnant with herbs, shrubs and/or trees.

All these wetlands have great educational value, especially in the arts and in the sciences.

Developing an outdoor laboratory and program is not easy. Use your imagination. One idea leads to another and a dream becomes a reality.

Procedural Steps For Developing An Outdoor Laboratory

ESTABLISH A SCHOOL SITE OR OUTDOOR LABORATORY COMMITTEE.

Select a key administrator or other school personnel to head the project.

Possible committee members:

Landscape architect, land-use planners, the supervisor of buildings and grounds, teachers, P.T.A. representative and other interested members of the community, school board member, students and a representative of state and federal conservation agencies.

COLLECT RESOURCE MATERIALS.

Set up a file of information on conservation and school ground planning.

Get information on "existing" projects of a similar nature. Profit by their experience and improve upon it.

JOIN THE COUNTY SOIL AND WATER CONSERVATION DISTRICT.

The District provides technical assistance through state and federal conservation agencies. Detailed soil maps and soil interpretations will be provided for the site.

The local representative of the U.S. Soil Conservation Service can provide soils information and basic land

use planning; the local game protector and waterway patrolman—wildlife information; the district forester—forest and water information.

Assistance in site planning from the standpoint of soil, water, vegetation and wildlife management is available.

This program costs no money, places your land under no obligation and provides a basic planning tool in determining multiple-use needs.

MAP AND INVENTORY THE ENTIRE SITE.

Plot contours of the land to show slopes and swales.

Record vegetation cover types and their distribution.

Show streams, wet areas, rock outcrops and other natural features.

Locate teaching stations.

Locate possible vistas to show relationship of outlying terrain features and land uses.

Plan a trail connecting the teaching areas. Urban areas may not have a woodland trail but resources need to be designated and a "trail" planned just as carefully.

Do not overlook nearby areas which might be leased. Many times a low-cost, long term lease can be obtained, thus economically enlarging the scope of the site. Easements also should be considered.

REVIEW INVENTORY.

Have inventory reviewed by resource individuals and groups—include conservationists, agency personnel, sportsmen's clubs, women's clubs, garden clubs, P.T.A. and service clubs.

PREPARE A DETAILED LONG TERM PLAN.

The preparation of a step-by-step plan is essential. This plan should include specifications and cost figures.

Organize a trail system by having a main trail with loop trails leading off from it, e.g., geology, forestry, wildlife and/or aquatic loop trails.

PUBLICITY.

Publicize the program—it will help to sell the idea. Resistance to this type of program usually comes from lack of information.

HOW TO USE AN OUTDOOR LABORATORY

Use your outdoor laboratory effectively year round in Grades K-12.

Teacher training programs should be conducted for all teachers as a part of in-service training. Once teachers learn what is available on the site they will use it.

The following is a brief outline of possible uses for different subjects:

MATHEMATICS

Observe designs, shapes and patterns in nature.

Calculate soil erosion in a gully.

Measure tree diameter, circumference, radius, height and board feet.

Determine slope of land and differences in elevation.

Plan food costs for the noonday meal.

Use a compass for orienteering.

Construct a trail.

LANGUAGE ARTS

Keep a field notebook and record observations.

Develop a list of vocabulary words and their meaning.

Write poems and stories about the outdoors.

Find information in the library.

Plan the day's schedule.

SOCIAL STUDIES

Develop a conservation project.

Study the past and present economy of the area.

Explore local geography—hills, valleys, gullies, watersheds and streams.

Make and read maps.

Study the economics of land use.

Cemetery headstones are a source of historical information.

Measure minute climate variations in relation to slope, exposure, vegetation cover at various points, recording such factors as precipitation and air humidity, temperatures, evaporation and wind velocity.

Science

Study wildlife habits—homes, tracks, food, adaptations and shelter.

Explore ecological areas such as woodlands, fields, ponds, streams and learn the interrelationships of the plants and animals.

Identify trees and other plants.

Study the weather.

Test the soil for texture, acidity, compactness, water absorption, profile and nutrients.

Examine rocks and minerals for color, composition, hardness and origin.

Study astronomy.

Make aquatic studies.

Art and Music

Paint and sketch with natural colors using leaves, flowers, berries, charcoal or rocks.

Make collages and mosaics from native materials.

Weave with grasses and reeds.

Listen and record sounds of birds, streams, wind and trees.

Write songs.

Sing songs about the outdoors.

Use a camera.

Health and Physical Education

Plan a well-balanced noonday meal.

Dress properly for the outdoors.

Practice outdoor safety.

Make and play games with native materials.

Do some hiking.

Take a course in hunter safety.

Learn to shoot—skeet, trap, target or archery.

Go skiing.

Practice casting.

Industrial Arts

Design a product utilizing natural resources found on the school site, such as wood, bark, minerals, sand and

gravel and water. Locate resources, decide on management, harvesting and extraction.

Study, identify, and manage a plantation of trees used by the furniture, lumber and paper industries.

In a unit on industrial design, design, produce and install signs and exhibits which will beautify the area and aid in the achievement of the school site's objectives.

Plan, lay out, construct and set up a manufacturing industry model to show relationships of industry to natural resources and markets.

Prepare and install scale model exhibits of various mining methods.

Construct shelters, bridges, check dams, tables, fireplaces, birdhouses and feeders.

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